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Does healthy lifestyle contribute to physical and mental health among University students?

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Abstract

Background: Little is known of how a healthy lifestyle and its health outcomes are related in university students in Indonesia. This study examined the association between healthy lifestyle markers (diet, sleeping hours, physical exercise, smoking, alcohol intake) and health outcomes (perceived physical fitness, psychological distress) among undergraduate students at university in Indonesia. We also examined gender-related patterns. **Methods:** A total of 616 undergraduate students participated in two cross-sectional studies carried out between 2011 and 2013. Six close-ended questions were used to measure health behaviors and perceived physical fitness. The Hopkin Symptoms Checklist-25 was used to measure psychological distress. **Results:** The results showed gender differences in physical exercise, smoking, and alcohol intake. A healthy diet, regular physical exercise, and adequate sleeping hours were identified as contributing factors for perceived physical fitness. The probability of experiencing mental health problems was 65% higher among sedentary students and being female doubles this risk. **Conclusion:** Engagement in physical exercise consistently contributes to both measures of health outcome. Further, this study found that female students had greater susceptibility to health issues due to a sedentary lifestyle than male ones.

Keywords: healthy lifestyle, physical fitness, psychological stress

Introduction

The greater demand on university students may lead them to experience greater stress.¹ Many may adopt unhealthy lifestyles, in part due to weak time management and limited possible options to pursue healthy behaviours.² A growing body of evidence indicates that people often begin risky behaviors during university study, including smoking, alcohol consumption, unhealthy diet, sleeping disturbance, and physical inactivity.^{3–5}

Notably, smoking is identified as a mechanism that helps university students cope with stress⁶, and those who smoke tend to engage in other health-risk behaviors, such as drinking alcohol and being sedentary.⁷ The health-risk behaviors of smoking and drinking alcohol are much more prevalent among male students than their female counterparts.⁸ Moreover, a recent study carried out among university students in Bahrain showed a significant difference between male (19%) and female students (35%) in the dietary habit of afternoon snacking.⁵ The same study identified that the female students were more sedentary than the males. Additionally, a study that investigated the association between sleep quality, physical fitness, and body mass index among first-year students in Taiwan found that more female students were poor sleepers, getting less

than 7 hours of sleep per day than males, and male students scored better on physical fitness tests.⁹ Overall, irrespective of the gender, university students who engaged in a healthy lifestyle tended to report better physical and mental health with improvements in professional longevity than those who did not.¹

Previous studies have shown that physical fitness is an essential marker of physical health among young populations.¹⁰ It is more feasible to measure physical fitness with a self-report questionnaire, in which students assess their own level of physical fitness.¹¹ Perception of physical fitness is a reliable indirect measure of actual physical fitness,¹² including the self-estimation of general sports competence and physical fitness abilities, including strength and endurance.^{13,14} Conceptually, this perception has two aspects: health-related fitness (cardiorespiratory endurance, muscular endurance, body composition, and flexibility) and skill-related fitness (agility, balance, coordination, and speed).¹⁵ In self-perception of physical fitness, cultural values in some Western societies indicate different ideas for different genders¹⁶ and this perception is relevant to the Indonesian context. For instance, women are expected to conform to precise standards of slenderness to exhibit their femininity, but the male population was expected to be masculine and physically powerful.¹⁶

Thus, one's gender is important in shaping the perception of one's own physical fitness.

Psychological distress is often used as a proximal factor to measure mental health in student populations.¹⁷ Psychological distress involves undesirable subjective states, such as depression and anxiety, that manifest through emotional and physical symptoms.¹⁸ Over longer periods, suffering from high-intensity psychological distress can have negative impacts on one's mental health.¹⁹ A study carried out among undergraduate students in a Malaysian dental surgery program identified that depression, anxiety, and stress were prevalent among female students and more prevalent among younger ones.²⁰ That study also showed that the depression, anxiety, and stress were caused by lack of time management skills, fear of failing one's examinations, receiving low grades, feeling incompetent, and experiencing the pressure to study.

Several studies have shown that university students who get adequate sleep tend to maintain acceptable levels of distress, which may prevent them from developing more severe mental health problems and sleeping disturbances.^{21,22} Previous studies have also shown that physically active students and those who consumed more vegetables and fruits achieved better academic performance, showed improved self-esteem, and reported a lower psychological distress level.^{23,24} Additionally, the ability to identify stressors and distress levels helps students improve their mental health status.^{25,26} The above reasoning indicates that a healthy lifestyle makes a contribution to a student's physical and mental health outcomes. The primary objective of this study was to examine the associations among healthy lifestyle, physical health, and mental health in university students in Indonesia. This study also examined whether and how any relationship between the three health-related factors vary by gender.

Methods

This is an epidemiological study, using self-report questionnaires to measure both healthy lifestyle and its health outcomes. Furthermore, we rely on the participants to truthfully report their actual healthy lifestyle behaviors and health status, which might introduce bias to the data.

Participants. The participants were undergraduate students officially registered at the Universitas Indonesia, either Indonesian citizens or international students with a student visa or a cultural visa. The Indonesian students were randomly selected from the student registry, and the international students were recruited through incidental sampling and snowball sampling.

Measurements. Dietary behaviors, sleeping hours, physical exercise, smoking, alcohol intake, and perception of physical fitness were assessed through six closed-ended questions. The questions were based on WHO health recommendations for the adult population^{27,28} and the recommendations of the Centers for Disease Control and Prevention for an adult population.

Each *Yes* response for the healthy diet, physical exercise, sleeping hours, and perception of physical fitness question was scored as 1, and each *No* for the smoking and alcohol intake question was scored as 1. The maximum score for the healthy lifestyle questions is five, which represents regular engagement in healthy lifestyle behaviors. Furthermore, *Yes* answers regarding the perception of physical fitness questions represent positive perceptions and *No* denotes negative ones.

Mental health, represented by psychological distress level, was measured using the Hopkins Symptoms Checklist-25 (HSCL-25). The HSCL-25 measures the presence and intensity of anxiety (10 items) and depression (15 items) symptoms experienced within the last seven days. The HSCL-25 has four possible responses, ranging from 1 (no influence) to 4 (immensely influenced).^{29,30} The total score for the HSCL-25 is the average score of the 25 items, and the case score is determined relative to the cutoff point of 1.75. This cutoff score has been shown to be more suitable in Asian populations, including Indonesia.^{31–33} Scores below 1.75 represent lower levels of psychological distress, while scores ≥ 1.75 represent higher levels. The Cronbach's alpha (α) for HSCL-25 in this study was 0.91.

Data collection and data analysis. Before it was begun, the proposal for this study was reviewed by the Faculty of Psychology at Universitas Indonesia, to ensure that all the steps taken in this study would protect the rights of the participants. The study was carried out in accordance with the ethical standards of the Helsinki Declaration. The data were collected from two cross-sectional studies carried out in 2011, among Indonesian students, and 2013, for international students. Participation in the study was voluntary, and the participants gave written informed-consent for their participation. We provided small souvenirs as a token of appreciation for the time. A total of 616 students aged 17–40 years participated, with 40.6% ($N = 250$) of the total being male and 59.4% ($N = 366$) being female. All participants provided demographic data, including gender, age, student status, and current courses. These data are presented in Table 1.

The data were analyzed in three steps using SPSS for Windows version 22.0. First, descriptive statistics were computed for healthy lifestyle behaviors, physical fitness, psychological distress, and demographic data to

verify missing data and any violation of data scores. There were no violated scores, so no questionnaires were eliminated in this study. Second, a chi-squared test was used to review engagement in healthy behaviors based on gender. The following step involved two sequences of logistic regression to identify the contributing factors of perceived physical fitness and mental health, based on gender and healthy behaviors.

Results

Table 1 shows that male students (57.5%) were more likely to report engaging in more than one healthy lifestyle behaviors than their female counterparts (39.6%). Female students reported a significantly higher level of psychological distress (30.5%) than males (14.1%). Significant differences in physical exercise, smoking, and alcohol intake were also found between male and female students, whereas no significant

differences found in healthy diet and sleeping hours based on gender. Male students (15.9%) tended to report exercise more than female students did (6.3%). Fewer female students reported smoking (8.3% vs. 10.9%) and consuming alcohol (2.1% vs. 5.4%) regularly than males (Table 1).

We present a model using six factors (healthy behaviors and gender), and perceived physical fitness in Table 2. It was found that healthy diet (OR = 2.05, $p = 0.000$), physical exercise (OR = 1.73, $p = 0.013$), and adequate sleeping hours (OR = 1.54, $p = 0.016$) were significant contributing factors for positive perception of physical fitness among students. The strongest contributing factor was healthy diet, which indicated that students who followed a healthy diet were twice more likely to perceive positive physical fitness than those who were not.

Table 1. Description of samples in relation to gender

Variables	Male (N = 250) N (%)	Female (N = 366) N (%)
Age		
≤19	44 (7.1)	88 (14.3)
20–29	196 (31.8)	269 (43.7)
30–39	9 (1.5)	6 (1)
≥40	1 (0.2)	3 (0.5)
Studentship		
Indonesian	183 (29.7)	326 (52.9)
International	67 (10.9)	40 (6.5)
Course		
Health sciences (<i>medicine, dentistry, public health, nursing, psychology</i>)	28 (4.5)	126 (20.5)
Social sciences (<i>economics, political science, culture and literature, law</i>)	89 (14.4)	132 (21.4)
Natural sciences (<i>engineering, mathematics, physics, chemistry, biology</i>)	105 (17)	96 (15.6)
Bahasa Indonesia for foreign speakers	28 (4.5)	12 (1.9)
Healthy lifestyle behaviors		
None	6 (1)	118 (19.2)
One behavior	70 (11.4)	161 (26.1)
Two behaviors	89 (14.4)	65 (10.6)
Three behaviors	60 (9.7)	10 (1.6)
Four behaviors	22 (3.6)	0 (0)
Five behaviors	3 (0.5)	
Psychological distress		
Low level (<1.75)	163 (26.5)	188 (30.5)
High level (≥1.75)	87 (14.1)	
Diet		
Yes	135 (21.9)	172 (27.9)
No	115 (18.7)	194 (31.5)
Physical exercise		
Yes	98 (15.9)	39 (6.3)
No	152 (24.7)	327 (53.1)
Sleeping hours		
Yes	82 (13.3)	136 (22.1)
No	168 (27.3)	230 (37.3)
Smoking		
Yes	67 (10.9)	51 (8.3)
No	183 (29.7)	315 (51.1)
Alcohol intake		
Yes	33 (5.4)	13 (2.1)
No	217 (35.2)	353 (57.3)

Table 2. Contributing factors for the perception of physical fitness in relation to healthy lifestyle behaviors and gender

Factors ^a	Odds Ratio (CI 95%)	<i>p</i>
Healthy diet***	2.05 (1.46–2.87)	0.000
Physical exercise*	1.73 (1.12–2.67)	0.013
Sleeping hours*	1.54 (1.08–2.18)	0.016
Smoking	0.75 (0.48–1.15)	0.184
Alcohol intake	0.92 (0.48–1.79)	0.812
Gender	0.96 (0.66–1.38)	0.810

^aDependent variable is perceived physical fitness**p* < 0.05 ***p* < 0.01 ****p* < 0.001R² 0.182**Table 3.** Psychological distress level in relation to healthy lifestyle behaviors and gender

Factors ^a	Odds Ratio (CI 95%)	<i>p</i>
Healthy diet	0.96 (0.69–1.33)	0.794
Physical exercise*	1.54 (1.05–2.56)	0.029
Sleeping hours	1.26 (0.89–1.78)	0.197
Smoking	0.96 (0.61–1.49)	0.840
Alcohol intake	0.83 (0.43–1.59)	0.566
Gender**	0.56 (0.39–0.80)	0.001

^aDependent variable is the case of psychological distress (score HSCL-25 ≥ 1.75)**p* < 0.05 ***p* < 0.01 ****p* < 0.001R² 0.171

In Table 3, we showed the psychological distress based on the healthy lifestyle and gender. The model showed that healthy behaviors and gender affect the likelihood of reporting a higher level of psychological distress. As indicated in Table 3, the probability of suffering from psychological distress is 65% higher for students who are less involved in physical exercise (OR = 1.54, *p* = 0.029). In addition, being a female doubles the risk of suffering from a higher level of psychological distress (OR = 0.56; *p* = 0.001).

Discussion

Healthy lifestyle behaviors in relation to gender among university students. In this study, male students identified themselves as physically active more than female students did. This finding is analogous to the results of previous research among university students in Spain, which showed a similar trend: male students practice physical exercise more than their female counterparts.³⁴ Furthermore, being sedentary was identified as a possible contributing factor to oral health in the adult population of Malaysia.³⁵

This study identified profound gender differences in smoking and alcohol intake, where male students showed a significantly higher proportion of smoking and alcohol consumption than female students. Previous study has identified similar results regarding the associations among smoking, alcohol consumption, and gender among university students in China. It has been found that female university students report less engagement in smoking and lower alcohol intake than male students, which is also related to other health-risk habits, such as unhealthy eating behaviors, substance

abuse, and injuries.^{8,36} This particular finding is highly relevant to Indonesian setting because the female population is not commonly expected to smoke and drink alcohol, especially in public areas.

Perceived physical fitness related to healthy lifestyle behaviors and gender among university students.

This study determined that a healthy diet was the strongest contributing factor for perceived physical fitness among students. Those who reported healthy eating behaviors were twice as likely to perceive their own physical fitness as positive than those who reported unhealthy eating. The inadequacy of nutritional diet among students may have been caused by their limited understanding of nutritionally balanced meals, and lower involvement in grocery shopping and food preparation before beginning to live independently as a university student.² Nevertheless, a longitudinal study showed a significant decrease in fitness levels among university students between 1996–2008.³⁷

The second healthy behavior related to student perception of physical fitness is regular physical exercise. This result corresponds to a previous study carried out among nursing students in a Thailand university, where it was found that physically active students were more likely to report a positive perception of physical fitness relative to sedentary students.³⁸ Similar results were found from a study among university students in Taiwan, where students who routinely practice physical exercise tend to report better physical fitness than those who are sedentary.³⁹

Additionally, university students tend to associate their physical health and fitness with appearance and attractiveness.⁴⁰ Consuming healthy meals, exercising

regularly, and maintaining a healthy body weight lead to a tendency to perceive themselves as physically fit and healthy. Therefore, it would be natural for university students to assess their physical fitness based on their dietary habit and physical exercise as part of an effort to maintain healthy body weight, better physical condition, and appearance, as found in this study.

Adequate sleeping hours is the third identified contributing factor toward the perception of physical fitness among university students. A previous study identified that more than 60% of university students reported a disruption in sleeping hours affecting the quality of their sleep during their time at the university.⁴¹ A previous study among first-year students in Taiwan showed an association between poor sleep and lower physical fitness.⁹ Students with fewer sleeping hours and lower sleep quality may have reduced energy levels. Thus, lack of sleep among university students may influence perceptions of physical fitness. The relationship between sleeping hours and perceived physical fitness means that the context of this study and the demography of the participants should be taken into account. Of the total international students at Universitas Indonesia, 17.4% participated in the study, which leads to the provisional conclusion that adequacy of sleeping hours may contribute differently to the perception of physical fitness in international students. This may relate to the fact that international students may come from different time zones to Indonesia from their home countries, requiring them to be awake late to communicate with their family and friends at home.

Psychological distress based on healthy lifestyle behaviors, and gender among university students. This study identified physical exercise as the most robust healthy habit for prediction of mental health status among university students. Sedentary students faced 65% greater chance of suffering mental health difficulties than those who were physically active. This finding is in line with previous research carried out among university students in the United States, where it was found that students who were physically active were less likely to report stress and other mental health issues.⁴² In this study, mental health was measured through psychological distress. Students who were physically less active reported higher psychological distress; conversely, those who were physically active reported lower psychological distress. A previous study regarding health-related behaviors and perceived stress among university students was undertaken as a part of the College Health & Nutrition Assessment Survey in the United States. It found that university students who engage in two or more healthy behaviors tend to report a lower level of perceived stress than those who engage in less than two behaviors; this was relevant for male and female students.⁴³ Furthermore, students who chose the most relevant lifestyle behaviors to satisfy their

psychological needs and motivations subsequently showed greater involvement in physical activities.⁴⁴

Additionally, gender is an important factor in this particular finding, as being female doubles the risk of suffering mental health problems compared to being male. A previous study found that male students tend to adapt to their new role as a university student much better than females.⁴⁵ Better adaptative skills may help male students become well-adjusted to their new roles and prevent them from additional stress with that suffered by their female counterparts.

This study has some limitations that should be considered in designing future research. First, it utilized a set of self-report questionnaires to measure healthy lifestyle, physical fitness, and mental health. The use of self-report to collect data incurs the danger that participants will manipulate their responses and not report actual behaviors. Second, the close-ended questions used to measure healthy lifestyle and perceptions of physical fitness prevent more detailed analysis of actual behavior, such as the amount of time spent in exercise and sleep, sleep quality, choice of physical exercise, nutrient levels of dietary intakes, actual tobacco use and alcohol intake, and other specific measurements. Third, as this study used a cross-sectional survey design, its findings cannot be evidence of any causal relationship among healthy lifestyle, physical, and mental health outcomes for university students in Indonesia. Therefore, a more robust study design that would explore the causal effects of actual healthy lifestyle behaviors on physical and mental health outcomes among university students would extend this field of knowledge.

Conclusion

Engagement in physical exercise consistently appears as an important factor in our findings and showed a strong association with both physical and mental health, as measured in this study. Female students showed greater susceptibility to health issues due to their more sedentary lifestyle than that of their male counterparts. Therefore, fostering the gender-sensitive programs and policies to increase engagement of physical exercise and other healthy lifestyle behaviors among university students is vital, especially for female students. This suggestion would need to be supported by the full ability to utilize on-site sports facilities for those who are not student-athletes and to further embed this in the curriculum as well.

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Conflict of Interest Statement

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